

Ahead in the clouds

Introducing HAN-GINS Cloud
Technology UCITS ETF (SKYY)

October 2018



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the importance of cloud computing

The concept of cloud computing is a technological change brought about by the convergence of a number of new and existing technologies.

It is essentially the delivery of computing services such as storage, networking, databases, software applications and analytics over the internet – combined this is known as the cloud. The cloud concept proposes the following benefits to corporates who have either existing, or looking to grow IT infrastructure:

- + Speed: The performance for one should be the same for thousands of users
- + Cost: No infrastructure setup liabilities for the end-client, and generally a pay-as-you-go service
- + Access: Applications and end-clients are not locked into specific locations
- + Scalability: On-demand, with the ability to scale-up or down with instant availability
- + Reliability: Cloud data is mirrored across multiple sites
- + Productivity: The lack of onsite hardware reduces the need for software patching and hardware setups

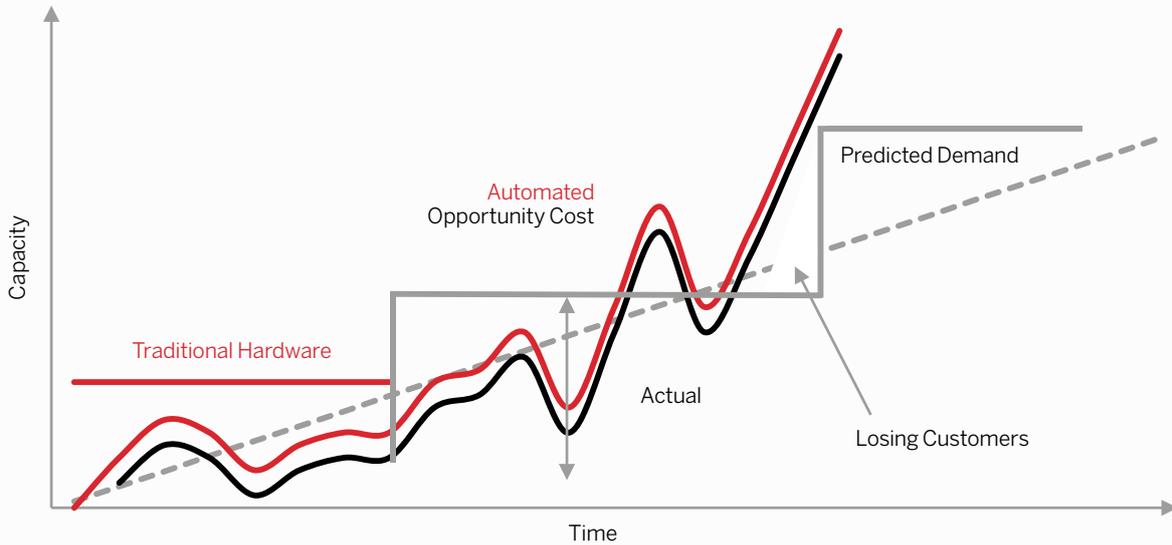
The following table shows some of the characteristics of traditional IT compared to Cloud-Computing.

Traditional IT	Cloud Computing
Hardware on premises	Hardware hosted off premises
Hardware provisioned for peak demand	Services provisioned based on actual demand
under or over-provisioning can lead to financial loss	Elasticity in capacity mitigates provisioning risks
Business invests in ownership of IT assets	Ownership risks are transferred from buyer to cloud service provider
Changes to hardware/software can be costly	Cloud service provider administers hardware

The model capacity utilisation curve below illustrates the concept of cloud-based services where on-demand provisioning can meet usage, save costs and mitigate risks from underinvestment in a traditional hardware setup.



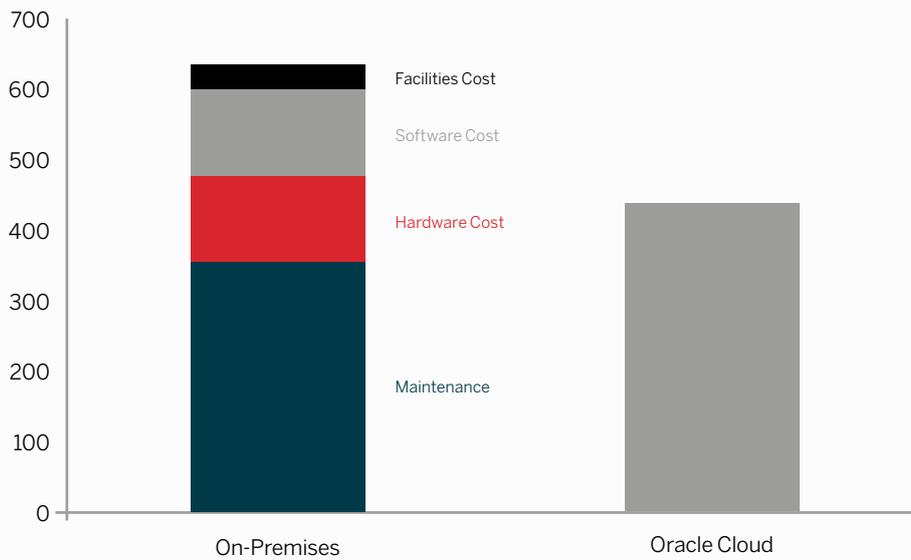
hardware vs cloud expenditure



Source: AWS, HANetf, data available as of close 19 September 2018

Cloud computing helps avoid the cost impact of over- and under-provisioning in addition to the opportunity cost, revenue and margin advantages of business services deployed in the cloud. Furthermore, it helps businesses exploit new markets due to the low entry costs of cloud services relative to traditional hardware investment.

Relative Cost Of Traditional Hardware Vs Cloud

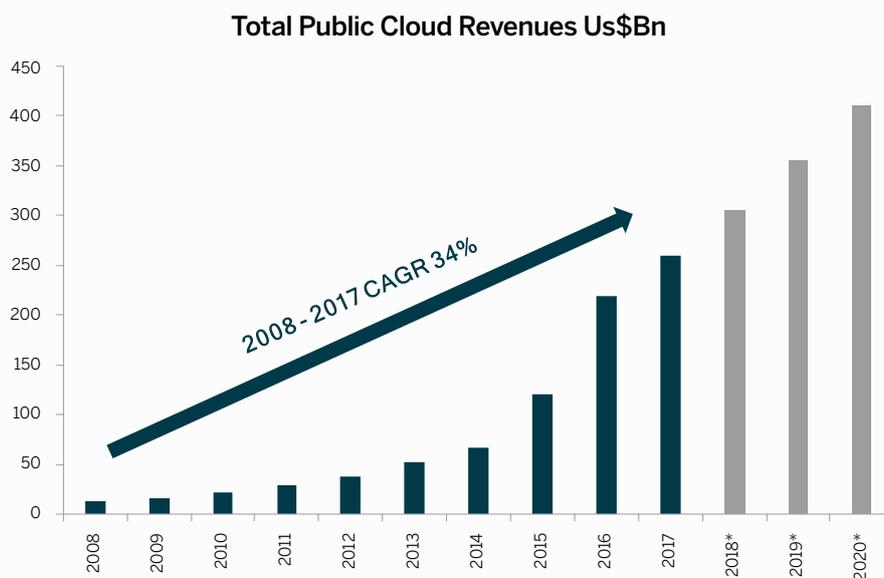


Source: Bloomberg Intelligence 2017, HANetf, Data Available As Of Close 20 September 2018



hardware vs cloud expenditure

Analysis from Bloomberg Intelligence highlights that an organisation may incur 30% in cost savings if it were to switch from an on-premises hardware system to a cloud based one. This is most likely the primary driver in business's decision to move to the cloud. As a consequence, cloud computing is growing at rates that are surprising even the most bullish IT analysts, changing the fortunes of traditional hardware and software vendors.



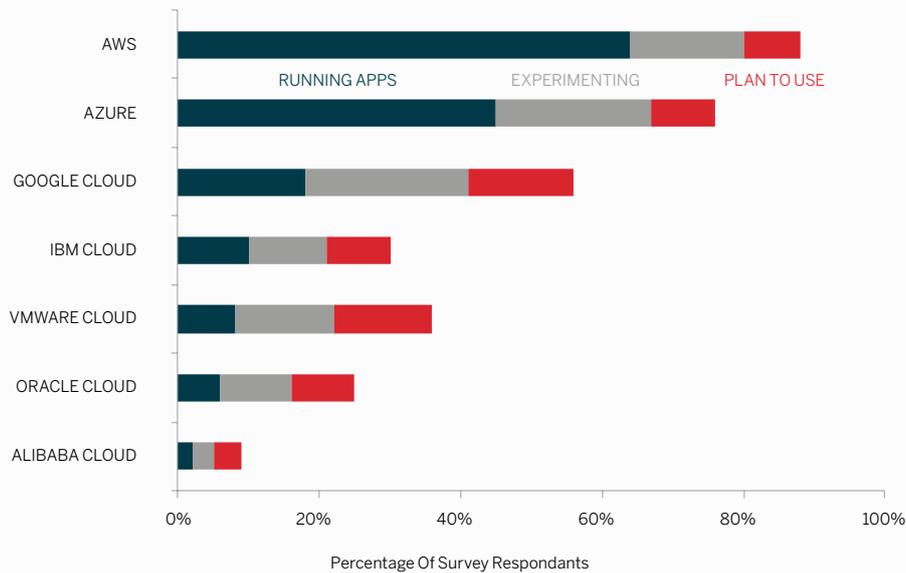
Source: Forrester, *Gartner Forecasts, Hanetf, Data Available As Of Close 20 September 2018

Many enterprises are moving away from traditional hardware and are attracted to cloud solutions due to their zero-upfront infrastructure investments and rapid time-to-market. A survey by Skyhigh of 460 senior executives regarding cloud strategy revealed that in adopting a cloud framework, there was an average of 20% improvement in the time to market for these businesses, which resulted in an average of 19% increase in company growth and an average of 18% increase in process efficiency. This shows that utilising a cloud strategy enables companies to get the products out to market quicker than their competitors which results in faster growth and higher return on investment.

A recent RightScale survey of key IT spenders in global corporates highlights how many respondents are now using the cloud.



public cloud adoption



Source: Rightscale 2018 State Of The Cloud Report, Hanetf, Data Available As Of Close 14 September 2018

This rapid take-up of cloud services will continue to fuel the demise of legacy hardware vendors that are clinging to the shrinking business of developing and implementing on-premises hardware systems. Cloud service providers are benefitting substantially from the recent rise in cloud usage.

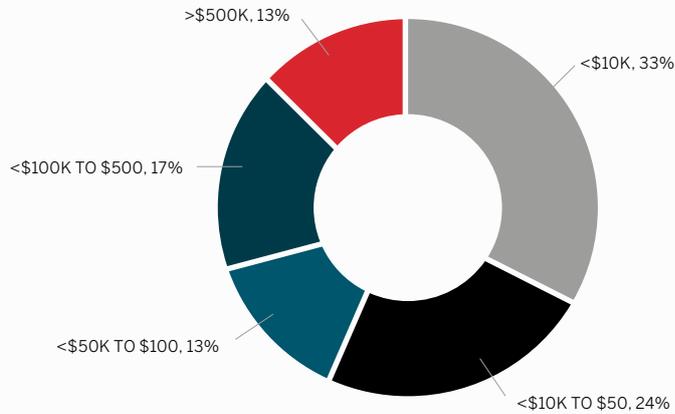
	2017 Revenue	2017 Market Share (%)	2016-2017 Growth (%)
Amazon Web Services	12,221	51.8	25
Microsoft Azure	3,130	13.3	98.2
Alibaba	1,091	4.6	62.7
Google	780	3.3	56
IBM	457	1.9	53.9
Others	5,902	25	9.5
Total	23,580		29.5

Source: Gartner, August 1st, 2018

Enterprise cloud spend is significant and growing quickly. As use of public cloud has grown, so has the spend. Public cloud spend is quickly becoming a significant new line item in IT budgets, especially among larger companies. Among all respondents of the RightScale survey, 13% spend at least US\$6 million annually on public cloud while 30% are spending at least US\$1.2 million per year.

¹ <https://www.gartner.com/newsroom/id/3884500>

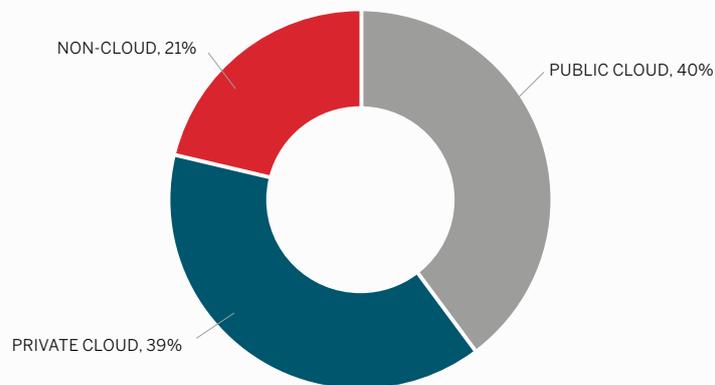
monthly public cloud spend



SOURCE: RIGHTSCALE 2018 STATE OF THE CLOUD REPORT, HANETF, DATA AVAILABLE AS OF CLOSE 20 SEPTEMBER 2018

Companies now run 79% of workloads in cloud, with 40% of workloads in public cloud and 39% in private cloud.

Proportion Of Workloads In Cloud



SOURCE: RIGHTSCALE 2018 STATE OF THE CLOUD REPORT, HANETF, DATA AVAILABLE AS OF CLOSE 20 SEPTEMBER 2018

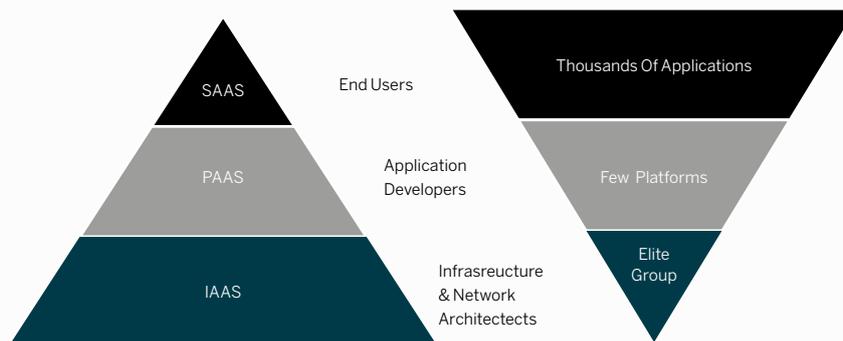
It is clear that the cloud computing industry is likely to continue to expand rapidly as it has done so in the past few years, as more businesses continue to shift their physical, on-premise infrastructure over to the cloud to reap the aforementioned benefits.



the components of cloud computing

Cloud services have evolved into three main components which businesses can cherry-pick from; Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS)

The Cloud Pyramid



SAAS

- + SaaS is a process for delivering software applications over the internet, on-demand, and typically on a subscription basis. Cloud providers host and manage the software application and underlying infrastructure and handle any maintenance, such as software upgrades and security patching. SaaS has been a growing method of delivering technology, such as in financial management, customer relationship management and healthcare management.
- + Because of the web delivery model, SaaS eliminates the need to install and run applications on individual computers. With SaaS, it's easy for enterprises to streamline their maintenance and support, because everything can be managed by the vendor.
- + SaaS is most commonly used to replace traditional on-device software such as Google Apps, Salesforce and Cisco WebEx.

PAAS

- + PaaS allows for the creation of web applications quickly and easily without the complexity of buying and maintaining the underlying software and infrastructure. In other words, it is a platform for the creation of software, delivered over the internet.
- + This type of service makes sense when there are multiple developers working on a development project or other external parties need to interact with the development process. In other words, PaaS makes it easier for developers to create web or mobile applications without worrying about setting up the underlying infrastructure.
- + Force.com is a PaaS platform, being commonly used to improve developer productivity, helping decrease an applications time to market.



iaas

- + IaaS is a way of delivering cloud computing infrastructure – servers, storage, network, and operating systems – as an on-demand service, rather than purchasing that infrastructure. In IaaS, resources are distributed as a service, which allows for dynamic scaling. This type of service makes sense when an organization has very volatile demand, and as a result, there is fluctuating demand for the infrastructure as well.
- + IaaS is most beneficial for small companies that do not have the capital to invest in new hardware or if a company is growing rapidly and needs to scale its resources.
- + Amazon Web Services is one of the largest IaaS providers, helping replace traditional hardware whilst providing flexible infrastructure capacity.

There are 3 ways to deploy cloud services, public, private or a hybrid of the two. Public clouds are operated by third parties such as Amazon Web Services, private clouds are operated by a single organisation for the benefit of their geographically diverse business.

Hybrid clouds are becoming increasingly popular due to the sensitivity and security of data stored while allowing greater sharing between data and applications. In the 12 months since the last RightScale State of the Cloud Survey, both public and private cloud adoption has increased. The overall portion of respondents using at least one public or private cloud is now 96%.



security risks

A recent McAfee survey highlighted that 21% organisations have experienced data theft from the public cloud with a large portion of clients (36%) feel they have a lack of security controls in the cloud and broader IT.

Organisation Experienced The Following It Issues

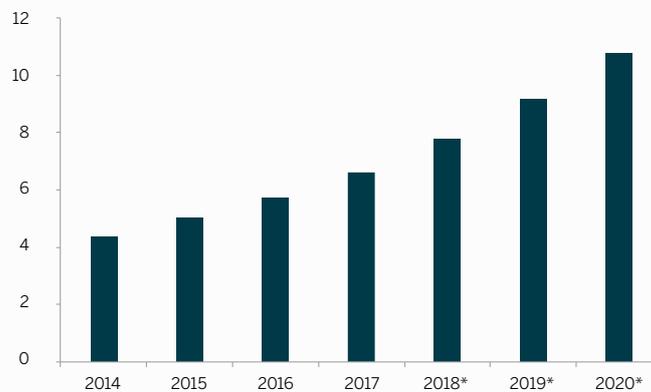


Source: McAfee, Hanetf, Data Available As Of Close 21 September 2018

The most recent Cloud Next conference mirrored these concerns with companies such as Google making it a key theme in all of their presentations, highlighting the physical security of its data centres, custom security chips (Titan) and large army of security engineers and two-factor authentication. Industry standards have now been created to help mitigate risks in the Cloud industry and alleviate end-user concerns after some high profile security events.

VMWare have now adopted the ISO/IEC 27001 standards for its vCloud products, which involves independent audits from Schellman and the ANSI-ASQ National Accreditation Board. All major contenders in the Cloud services business are now investing heavily into cloud security, and is becoming an important revenue source.

Global Cloud Security Market Us\$Bn



Source: Zion Research, *Forecast, Hanetf, Data Available As Close 20 September



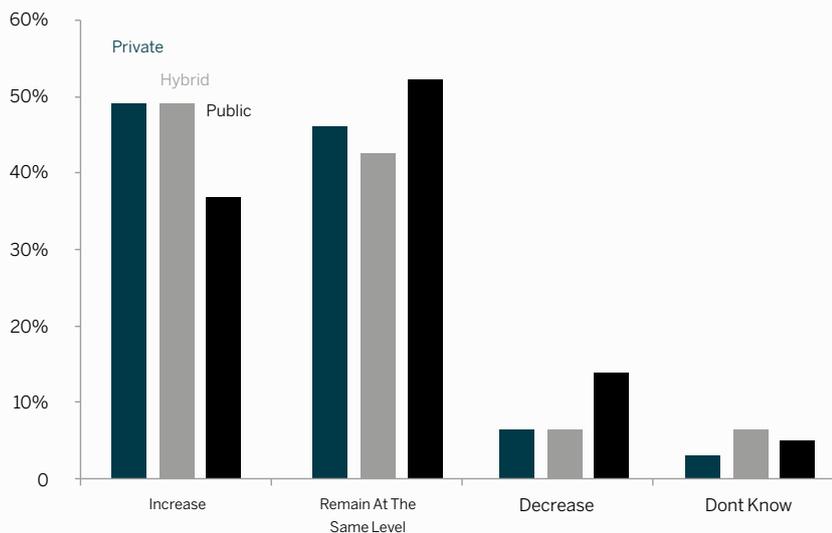
regulatory issues

In addition to the practical challenges that enterprises face in keeping track of data and securing it throughout its lifespan, several regulations and standards impact data in difficult ways.

The General Data Protection Regulation (GDPR) pertains to data that intersect with operations or activities that enterprises might perform in the European Union (EU) or that impact information that enterprises might hold about persons in the EU on the Cloud. Even for businesses for whom GDPR is not directly applicable, other geographically bounded regulatory considerations are useful to consider. For example, breach disclosure requirements in specific jurisdictions, such as US state laws, specify requirements for notification if data about customers are breached.

The McAfee survey highlighted that 10% of organisations anticipate decreasing public cloud investment as a result of the European Union's General Data Protection Regulation (GDPR), but the majority are either increasing or increasing investments as a consequence.

Cloud Investment Expectations Post-GDPR



Source: McAfee Survey Late 2017, Hanetf, Data Available As Of Close 21 September



conclusion

Cloud computing has ample benefits including but not limited to cost savings, efficiency, and speed, and can be deployed in numerous ways via public, private, or hybrid cloud. In addition, cloud computing services can be offered in different ways such as Infrastructure-as-a-Service, Platform-as-a-Service, and Software-as-a-Service, each with its own advantages.

There have been many drivers to the growth of cloud computing, including the significant cost savings that organizations have achieved along with smaller businesses now being able to compete with larger organisations by scaling their infrastructure (storage, servers, etc.) in the cloud rather than implementing the IT resources on premise. This has led to an increase in cloud computing spending, and this spending is projected to continue to increase as organizations continue to divest from physical infrastructures.

The risks for corporates transferring to the cloud are primarily around technical expertise and cyber security which is encouraging is not discouraging cloud adoption and creating a sub-industry focussed on the physical, hardware and software security to ensure clients data is kept safe.

The fears over regulations and data privacy appear over-done, with it leading to only 10% of organisations decreasing their cloud spend.

Cloud Computing is an important stage in the development of IT systems, comparable with the emergence of the mainframe, the minicomputer, the microprocessor, and the Internet.

Cloud Computing can provide many advantages over conventional approaches to IT provisioning, which can translate into significant improvements in ROI. But what makes it particularly exciting is that its potential effect on business is not just incremental improvement, but disruptive transformation through new operating models.



investing in cloud computing

Investing in companies that are involved in cloud computing can be an onerous and challenging research task for investors. That's why HANetf has created the HAN-GINS Cloud Technology UCITS ETF (SKYY) - a UCITS compliant Exchange Traded Fund domiciled in Ireland. SKYY tracks the Solactive Cloud Technology Index (Net Total Return), an index designed to measure the performance of companies active in the field of cloud technologies, such as service providers or producers of equipment or software focused on cloud computing.

The index selects constituents based on a rules-based artificial intelligence approach to identify and select companies involved in the field of cloud computing from both developed and emerging markets.

HAN-GINS Cloud Technology UCITS ETF is issued by HANetf and listed on London Stock Exchange, Borsa Italiana and Deutsche Boerse XETRA with a TER of 75bps.

EXCHANGE	B'BERG CODE / TICKER	RIC	ISIN	CCY
London Stock Exchange	SKYYLN	SKYY.L	IE00BDDRF924	USD
London Stock Exchange	SKYPLN	SKYPL	IE00BDDRF924	GBP
Borsa Italiana	SKYYIM	SKYY.MI	IE00BDDRF924	EUR
Deutsche Boerse XETRA	5XYE	5XYE.DE	DE000A2N5XC4	EUR

Fund Partner

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